CLAIMS

1. (Previously presented) A method for detecting and compensating for telephone network impairment in signal transmissions between a transmitting modem and a receiving modem coupled together via a telephone network employing robbed bit signaling during super frames, comprising the steps of:

a. repetitively transmitting a known training symbol through said network to a receiving modem;

b. mapping said training symbol at said receiving modem to a high or to a low level value for said symbol;

c. repeating said transmitting and mapping steps for a number of different known training symbol levels to establish a slicer table that compensates for the nature of the impairment caused by said robbed bit signaling, wherein:

a constellation of symbol levels is determined from said repetitive transmitting of said known training symbol levels; and

said constellation of symbol levels is determined by identifying the probability density function for each of different known training symbol level.

2-3. (Canceled)

4. (Previously presented) A method according to claim 1, wherein said constellation of symbol levels is determined by :

a.) calculating a mean value of said probability density function for each of said training symbol levels;

b.) determining a mean squared error for each level of said training symbol levels; and

c.) establishing a distance between symbol levels based on said mean squared error at each of said levels.

5. (Previously presented) A method for training a receiving modem connected through a telephone network to correct for differences between a transmitted and a received symbol occasioned by network impairment, comprising the steps of:

a. repetitively receiving a known training symbol at said receiving modem;

b. selecting between a high and a low value for said training symbol to identify said impairment; and

c. repeating said receiving and selecting steps for a number of different known training symbol levels to determine a slicer table which compensates for said impairment, wherein said network impairment includes said network preempting a least significant bit used to encode symbol levels during different phases of network frames, said repetitive receiving of said known training symbol being continued throughout the duration of a plurality of said encoding frames.

6. (Canceled).

7. (Previously presented) A method according to claim 5, wherein said network causes a received symbol to exhibit a high level during one phase of said network frames and a low level during another phase of said network frames, said slicer table being reconfigurable for each of said phases.

8. (Original) A method according to claim 7, wherein said slicer distinguishes between the high and low level values of each of said number of different known training symbol levels received on a particular one of said phases.

9. (Currently amended) A method for training a receiving modem connected through a telephone network to correct for differences between a transmitted and a received symbol occasioned by network impairments including robbed bit signaling which preempts a least significant bit of a customer's data depending on the frame assigned by the network for such connection, comprising the steps of:

a. repetitively transmitting a known symbol value over said connection to ascertain when said network impairment causes said symbol to be received at said modem as a higher or lower valued symbol;

b. constructing a slicer table entry containing a higher or lower value of said symbol for said assigned frame;

c. repeating said transmitting and said constructing for a number of different known training symbol levels to ~~compete~~ complete said slicer table; and

d. re-configuring said slicer table for use on another frame assigned by said network.

10. (Original) A method for training a receiving modem according to claim 9 wherein a constellation of symbol levels is determined by identifying the probability density function for each said number of different known training symbol levels.

11. (Previously presented) A method of processing signals in a network employing robbed bit signaling, the method comprising:

(a) receiving, at a receiver of the network, a signal corresponding to a training symbol;

(b) mapping said training symbol to a first level or a second level, said first and second levels corresponding to variation in the received signal due to the robbed bit signaling; and

(c) repeating steps (a) and (b) for one or more frames to determine a pattern employed in the robbed bit signaling.

12. (Previously presented) The invention of claim 11, further comprising:

repeating steps (a), (b), and (c) for one or more other training symbols; and

constructing a receiver constellation table based on (i) the mapped first and second levels for the training symbols and (ii) the determined pattern.

13. (Previously presented) The invention of claim 12, further comprising determining a slicer table corresponding to said constellation table.

14. (Previously presented) The invention of claim 12, wherein, for each transmitter level, the receiver constellation table has two levels.

15. (Previously presented) The invention of claim 12, wherein constructing the receiver constellation table comprises:

receiving a sequence of training symbols, each corresponding to a transmitter level;

forming a probability density function based on the sequence; and

determining the receiver constellation table based on the probability density function.

16. (Previously presented) The invention of claim 15, wherein constructing the receiver constellation table further comprises:

determining a mean value of the probability density function for each receiver level;

determining a mean square error for each said receiver level; and

determining at least one of minimum and maximum thresholds for each said receiver level based on the mean square error.

17. (Previously presented) The invention of claim 16, further comprising:

determining a distance between adjacent receiver levels based on the corresponding minimum and maximum thresholds;

comparing said distance with a threshold value; and

adjusting a constellation design, if said distance is smaller than the threshold value.

18. (Previously presented) The invention of claim 11, further comprising transmitting the training symbol using a transmitter of the network.

19. (Previously presented) A system for processing signals in a network employing robbed bit signaling, the system comprising:

means for receiving a signal corresponding to a training symbol in a frame;

means for mapping said training symbol to one of at least two levels, said levels corresponding to variation in the received signal due to the robbed bit signaling; and

means for processing one or more training symbols of one or more frames to determine a pattern employed in the robbed bit signaling.

20. (Previously presented) The invention of claim 19, further comprising means for transmitting the training symbol coupled to the means for receiving via the network.